

DEC 13 2005

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Intel Corporation
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Date: December 13, 2005

Page 1 of 25

TO:

Examiner: Board of Appeals c/o Luu, Matthew

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FROM:

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APPLICATION INFORMATION:

Application No.: 09/976,199

Inventor: Sundahl, et al.

Assignee: Intel Corp.

Docket No.: P9821

Filed: October 11, 2001

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Application Number 09/976,199

Filing Date 10/11/2001

First Named Inventor Robert C. Sundahl

Art Unit 2876

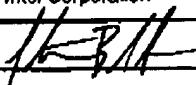
Examiner Name Luu, Matthew

Attorney Docket Number P9821

ENCLOSURES (Check all that apply)

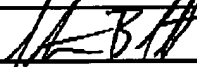
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PTO/SB/17 (12-04v2)

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FEE TRANSMITTAL
For FY 2005☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 500.00

Complete if Known

Application Number	09/976,199
Filing Date	10/11/2001
First Named Inventor	Robert C. Sundahl
Examiner Name	Luu, Matthew
Art Unit	2676
Attorney Docket No.	P9821

METHOD OF PAYMENT (check all that apply)☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☒ Deposit Account Deposit Account Number: 50-0221 Deposit Account Name: Intel Corporation

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FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES**Fee Description**

Each claim over 20 (including Reissues)

Each independent claim over 3 (including Reissues)

Multiple dependent claims

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	Fee (\$)	Fee Paid (\$)
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- 20 or HP = _____ x _____ = _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims Extra Claims Fee (\$)

- 3 or HP = _____ x _____ = _____

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(c)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
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- 100 = _____ / 50 = _____ (round up to a whole number) x _____ = _____

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge): Brief in Support of Appeal

500.00

SUBMITTED BY

Signature

Registration No.
(Attorney/Agent) 54,431

Telephone 503-264-7002

Name (Print/Type) Justin B. Scout

Date December 13, 2005

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Appl. No. 09/976,199

Attorney Docket: 042390.P9821

In The United States Patent and Trademark Office
Before The Board of Patent Appeals and Interferences

In re Patent Application of:)	Examiner:	Luu, Matthew
)		
Sundahl, <i>et al.</i>)	Art Unit:	2672
)		
Application No.: 09/976,199)		
)		
Filed: October 11, 2001)		
)		
For: LUMINANCE)		
COMPENSATION FOR)		
EMISSIVE DISPLAYS)		

APPEAL BRIEF
IN SUPPORT OF APPELLANTS' APPEAL
TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Honorable Director of the United States Patent and Trademark Office
Washington, DC 20231

Sir/Madam:

Applicants (hereafter "Appellants") hereby submit this Brief in support of their Appeal from a final decision by the Examiner in the above-captioned case. Appellants respectfully request consideration of this Appeal by the Board of Patent Appeals and Interferences for allowance of the claims in the above-captioned patent application.

An oral hearing is not desired.

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Appl. No. 09/976,199

Attorney Docket: 042390.P9821

TABLE OF CONTENTS

1. REAL PARTY IN INTEREST	3
2. RELATED APPEALS AND INTERFERENCES	3
3. STATUS OF THE CLAIMS	3
4. STATUS OF THE AMENDMENTS.....	3
5. SUMMARY OF THE CLAIMED SUBJECT MATTER	4
6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL	9
7. ARGUMENT.....	10
7.1. 35 U.S.C. § 103(A)	10
7.1.1. <i>Shen and Yamazaki: Claims 1, 3-7, 10-11, and 13-18</i>	10
7.1.2. <i>Kane, Shen, and Yamazaki: Claims 8, 9, and 19</i>	13
8. CONCLUSION	15
APPENDIX A: CLAIMS APPENDIX.....	16
APPENDIX B: EVIDENCE APPENDIX.....	20
APPENDIX C: RELATED PROCEEDINGS APPENDIX	21

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

1. REAL PARTY IN INTEREST

The invention is assigned to Intel Corporation of 2200 Mission College Boulevard, Santa Clara, California 95052.

2. RELATED APPEALS AND INTERFERENCES

To the best of Appellants' knowledge, there are no appeals or interferences related to the present appeal that will directly affect, be directly affected by, or have a bearing on the Board's decision.

3. STATUS OF THE CLAIMS

Claims 1, 3-11, 13-19 are now pending in the above referenced patent application. Claims 1, 3-11, 13-19 were rejected in the Final Office Action mailed on July 13, 2005 and are the subject of this appeal.

4. STATUS OF THE AMENDMENTS

One amendment to the claims was filed subject to the Final Rejection. Claim 11 was objected to as containing a minor typographical error. Claim 11 inadvertently contained the double phrase "having a having a" on line 7. Appellants thanked the Examiner for pointing this error out and amended the claim to address the PTO's concerns. No new matter was entered.

In an Advisory Action, on November 03, 2005, the PTO stated that this amendment was entered.

A copy of all claims on appeal is attached hereto as Appendix A.

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

5. SUMMARY OF THE CLAIMED SUBJECT MATTER

A light emitting diode (LED) may be characterized as a semiconductor device specifically designed to emit light when voltage is applied across the diode with a polarity that provides a low-resistance conducting path, or forward bias. An organic light emitting diode (OLED) is a particular type of LED in which a series of carbon-based thin films based on organic compounds may be sandwiched between two, or more, electrodes.

A multitude of LEDs or OLEDs may be configured together in an array to create a display system. Such a display system, including an array of OLEDs, in some situations, may comprise an emissive display.

Emissive displays, in this context, refer to a broad category of display technologies that at least partially generate light that is emitted. Some examples may include: OLED displays, electro-luminescent displays, field emission displays, plasma displays, and vacuum florescent displays. In contrast, non-emissive displays typically employ a separate external source of light, such as, for example, the backlight of a liquid crystal display.

A trait common to several emissive displays is that the output signal of the emitters degrades with use. For example, one of the most common emissive displays, the cathode ray tube (CRT), which is often used in televisions and personal computer monitors, usually contains phosphors whose ability to output light degrades with the age of the display. The useful lifetime of emissive displays is, therefore, typically measured as the time it takes for the luminance of the display to degrade by 50%.

This phenomenon is often apparent when an image is displayed on part of a screen for extraordinarily long periods of time. After the image is removed from the screen, the area where the image was displayed may be noticeably darker than other areas of the screen. The original

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

image is said to have been "burned-in" to the display and will often appear as a "ghost" image that seems superimposed with subsequent images that may be displayed in the same area of the screen. The emitters, which were used to display the "burned-in" image, may be thought to have become at least partially worn and are unable to display subsequent images as brightly as other emitters, which are less worn.

However, this degradation in the brightness or luminance of emissive displays is not limited to this extreme example. Use over time of one or more emitters of an emissive display often reduces the luminance of these emitters. As an example, despite images on a television's CRT frequently changing, a television's CRT is usually not as bright after a year of use as it was when first used.

This overall degradation behavior is frequently acceptable and possibly unnoticeable or barely noticeable if held within bounds or if it occurs over a relatively long period of time. However, the effect might be troublesome or undesirable if it occurred inconsistently at different locations of a display. This may happen because, as in the example above, one region of the display is used more frequently than the rest, as with, for example, the display of a logo. In such a circumstance, that region might age more rapidly and possibly exhibit the previously described burn-in effect. Alternately, this may happen because the display is tiled, such as sometimes occurs with flat-panel displays, for example, and the tiles of the display exhibit different aging characteristics. (USPTO Publication 2003/0071821, paragraphs 4-10.)

Typical output signal characteristics for an OLED device are illustrated in FIGs. 1 and 2. In this context, the terms "young" or "fresh" refer to a diode in which a relatively low level of total current has passed through the device during its useful life. Likewise, the terms "aged," "old," or "deteriorated," in this context, refer to devices, which have had a relatively substantial

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

amount of total current passed through the device. The terms do not refer to the chronological age of the OLED measured strictly or primarily by time. FIG. 1 illustrates a typical current and luminance characteristic of a fresh OLED. (USPTO Publication 2003/0071821, paragraph 18.)

In one embodiment, a technique may be employed to approximately compensate for this degradation in the luminance of the OLED, such as, for example, increasing the substantially constant current through the OLED or the voltage across the OLED based at least in part upon the estimated deterioration of the OLED.

At least one desired result of this technique may be the production of a substantially consistent amount of luminance from all OLED pixels. Based upon the desired amount of luminance, a measured characteristic, such as, for example, the reverse bias resistance of the OLED, may be used to effectively estimate approximately how much current or voltage to apply to the device to produce such a result. This approach makes use of a previously defined relationship between the value of the indicator, such as, for example, reverse bias resistance, and the current (or voltage) utilized to maintain the desired level of luminance. (USPTO Publication 2003/0071821, paragraphs 21 & 22.)

Other parameters may also be used to estimate the effective age of the device. For example, the reverse bias resistance of the OLED, may be measured while the device is in operation. However, one skilled in the art will recognize that there are many other characteristics of the OLED that may be measured and utilized. Characteristics, such as, forward bias resistance or the voltage across the OLED may be used; furthermore, there are many other possible characteristics, which may be measured or inferred. In addition, the desired characteristic in question need not be directly measured, but, instead, an indication of the

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

effective age of the device may be estimated by obtaining a measurement that is correlated with or related to the desired characteristic. (USPTO Publication 2003/0071821, paragraph 26.)

The choice of desired luminance is not necessarily limited to the initial luminance of the device. For example, in one embodiment, the luminance of the OLED may be allowed to gracefully degrade as the device ages. Curve 330 of FIG. 3 illustrates a graceful degradation of luminance as a function of age. Luminance ratio curve 330 is a representation of the ratio of the luminance presently desired over the original luminance, or $\frac{L}{L_0}$.

The previously described embodiment (in the specification) detailed an example where the desired luminance of the device is substantially constant and substantially equal to the original or initial luminance of the OLED. Other embodiments are contemplated where the desired luminance may be neither constant nor substantially equal to the original or initial luminance of the OLED. For example, it is contemplated that one embodiment may, for example, be created where the desired luminance of the OLED decreases as a function of the age of the OLED. An example of such an embodiment is described below. (USPTO Publication 2003/0071821, paragraphs 33 & 34.)

In one embodiment, the desired controlled degradation might take a variety of forms. As a few, but not exhaustive, examples, the curves utilized to control degradation may be linear, exponential, non-continuous, or numerically generated. It is contemplated that the controlled degradation may occur gracefully to a substantially predetermined point and then be allowed to degrade more quickly. For example, because the useful life of emissive displays is usually measured as the time it takes for the luminance to degrade by 50%, the embodiment may allow a graceful degradation to the 50% point, although other points may be chosen, and then the device may cease to power the OLEDs or the OLEDs may be allowed to degrade without a

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

compensating influence, such as, for example, one of the embodiments previously described. (USPTO Publication 2003/0071821, paragraph 40.)

Another embodiment is illustrated in FIG. 4. During operation, OLED 410 may receive a substantially constant current from current source 460. Resistor 412 and ideal diode 411 shown in OLED 410 are merely convenient approximations or representations of the distributed properties of the OLED provided for purposes of illustration. Measurement device 440 may measure the analog voltage at the output point of current source 460 or the input point of OLED 410, and convert this measurement to a digital signal. While, in this example, measurement device 440 measures the voltage across OLED 410, the claimed subject matter is not limited to this particular measurement point or the measurement of this electrical characteristic. This digital signal may be input to coefficient modifier 420 which may change the coefficient stored in coefficient storage array 430. The control system, as illustrated by coefficient modifier 420 and coefficient storage array 430, may, as an example, be implemented as a digital logic block or a series of machine executable instructions. The coefficients stored in coefficient storage array 430 may then be used to produce a signal that adjusts the amount of current provided by current source 460, for example. By adjusting the amount of current provided by the current source, the degradation in the luminance of the OLED may be at least in part compensated. (USPTO Publication 2003/0071821, paragraph 46.)

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

6. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The above referenced patent application has been reviewed in light of the Office Action, dated July 13, 2005, in which:

- claims 1, 3-7, 10-11, and 13-18 are rejected under 35 U.S.C. § 103(a) on Shen *et al.* (hereinafter 'Shen;' US Patent No. 6,414,661 B1) in combination with Yamazaki *et al.* (hereinafter 'Yamazaki;' US Patent No. 6,528,951 B2); and
- claims 8, 9, and 19 are rejected under 35 U.S.C. § 103(a) on Shen and Yamazaki in further combination with Kane (US Patent No. 6,229,508 B1)..

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

7. ARGUMENT**7.1. 35 U.S.C. § 103(a)****7.1.1. Shen and Yamazaki: Claims 1, 3-7, 10-11, and 13-18**

The PTO has rejected claims 1, 3-7, 10-11, and 13-18 under 35 U.S.C. § 103(a) based upon Shen in combination with Yamazaki. The rejection of these claims is respectfully traversed.

M.P.E.P. § 706.02(j) sets forth the standard for a § 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings.

Second, there must be a reasonable expectation of success.

Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (whitespace added).

Applicant begins with claim 1. Claim 1 recites:

1: (Previously Presented) A method for at least partially compensating luminance of an emissive display comprising:
 having a desired luminance, as a function of time, for one or more organic light emitting diodes (OLEDs) included in said emissive display;
 estimating the amount of degradation of the OLEDs; and
 utilizing, at least in part, the estimated amount of degradation, attempting to adjust (adjusting) the luminance of the OLEDs to the desired luminance.

Appellants respectfully assert that the combination set forth by the PTO fails to meet the requirement for a *prima facie* case for a § 103(a) rejection for at least the following reasons.

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

It is respectfully asserted that neither Shen nor Yamazaki, either alone or in combination, suggests or describes attempting to adjust (adjusting) the luminance of the OLEDs to the desired luminance, which is a function of time.

Shen instead recommends calibrating the display device to provide "uniform light output." Appellants respectfully assert that the limitation of the Appellants' claim refers to constant luminance temporally, as the one or more OLEDs degrades. In contrast, Shen's reference to "uniform light output" does not deal with the OLEDs but to the display as a whole, and a uniform light output spatially across the display. Nor does Shen suggest or describe adjusting the actual luminance to a desired luminance with is based upon time.

In the July 13, 2005 Office Action, the PTO retorts that Shen meets the "desired luminance, as a function of time" limitation in column 5, lines 5-20. It is respectfully asserted that neither this nor any other portion of Shen meets this limitation. It is asserted that while Shen discusses that the efficiency or luminance of a display changes over time, Shen does not discuss a desired luminance that changes over time. Shen instead discusses the actual or unadjusted luminance not the desired luminance. As such, Shen column 5, lines 5-20 and the associated are not significantly more enlightening than the concept described in the "Background Information" section of the Appellants' specification. Shen does not describe, teach, or show, having a desired luminance that varies with time, but instead shows an unadjusted luminance that varies with time. As shown by Shen Figs. 5A, 5B, 6, & 7, Shen determines the desired luminance based upon the spatial characteristics of the display not the temporal characteristics. Therefore, it is respectfully asserted that Shen continues to support a § 103 rejection.

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

As the Examiner points out, Yamazaki does not address temporal (i.e. time based) degradation but instead Yamazaki addresses degradation due to temperature. See, Yamazaki, column 1, lines 18-22 and column 31, lines 49 to column 32, line 14.

Therefore, even if the combination were proper, although Appellants believe that it is not, nonetheless, the combination would still fail to produce the invention as recited in the rejected claims. It is, therefore, respectfully requested that the rejection of this claim be withdrawn.

Claims 13-7, 10-11, and 13-18 either depend from and include the limitations of claim 1, or include a substantially similar and patentably distinct limitation as claim 1. Therefore, these claims patentably distinguish from the cited patents on the same basis as claim 1. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

7.1.2. Kane, Shen, and Yamazaki: Claims 8, 9, and 19

The PTO has also rejected claims 8, 9, and 19 under 35 U.S.C. § 103(a) on Shen and Yamazaki in combination with Kane. The rejection of these claims is also traversed.

Applicant begins with claim 8. Claim 8 recites:

1 8: (Original) The method of claim 7, wherein increasing includes utilization of a lookup table.

Claim 8 ultimately depends from the independent claim 1. Claim 1 recites:

1 1: (Previously Presented) A method for at least partially compensating luminance of an emissive
2 display comprising:
3 having a desired luminance, as a function of time, for one or more organic light emitting
4 diodes (OLEDs) included in said emissive display;
5 estimating the amount of degradation of the OLEDs; and
6 utilizing, at least in part, the estimated amount of degradation, attempting to adjust
7 (adjusting) the luminance of the OLEDs to the desired luminance.

Appellants respectfully assert that the combination set forth by the PTO fails to meet the requirement for a *prima facie* case for a § 103(a) rejection for at least the following reasons.

It is respectfully asserted that neither Shen, Yamazaki, nor Kane, either alone or in combination, suggests or describes attempting to adjust (adjusting) the luminance of the OLEDs to the desired luminance, which is a function of time. See the discussion above. Therefore, even if the combination were proper, although Appellants believe that it is not, nonetheless, the combination would still fail to produce the invention as recited in the rejected claims. It is, therefore, respectfully requested that the rejection of this claim be withdrawn.

Claims 9 and 19 either depend from and include the limitations of claim 8, or include a substantially similar and patentably distinct limitation as claim 8. Therefore, these claims

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

patentably distinguish from the cited patents on the same basis as claim 8. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

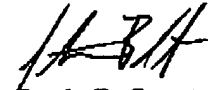
Appl. No. 09/976,199

Attorney Docket: 042390.P9821

8. CONCLUSION

In view of the foregoing, it is respectfully asserted that all claims pending in this application, as amended, are in condition for allowance. If the Examiner has any questions, they are invited to contact the undersigned at 503-264-7002. Reconsideration of this patent application and early allowance of all claims is respectfully requested.

Respectfully submitted,


Justin B. Scout
Reg. No. 54,431Dated: *Tue Dec 13, 2005*

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Appl. No. 09/976,199

Attorney Docket: 042390.P9821

APPENDIX A: CLAIMS APPENDIX

1 1: (Previously Presented) A method for at least partially compensating luminance of an emissive
2 display comprising:
3 having a desired luminance, as a function of time, for one or more organic light emitting
4 diodes (OLEDs) included in said emissive display;
5 estimating the amount of degradation of the OLEDs; and
6 utilizing, at least in part, the estimated amount of degradation, attempting to adjust
7 (adjusting) the luminance of the OLEDs to the desired luminance.

2: (Cancelled)

1 3: (Previously Presented) The method of claim 1, wherein estimating includes estimating a
2 characteristic substantially correlated with said degradation.

1 4: (Original) The method of claim 3, wherein said estimating includes measuring the voltage
2 across said one or more OLEDs at a substantially constant current flow through said one or more
3 OLEDs.

1 5: (Previously Presented) The method of claim 1, wherein measuring said voltage across said
2 one or more organic light emitting diodes (OLEDs) includes measuring the reverse bias
3 resistance of said one or more OLEDs.

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

1 6: (Previously Presented) The method of claim 1, wherein adjusting includes adjusting the
2 amount of electrical energy applied to said one or more organic light emitting diodes (OLEDs).

1 7: (Original) The method of claim 6, wherein adjusting includes increasing the voltage applied
2 across said one or more OLEDs.

1 8: (Original) The method of claim 7, wherein increasing includes utilization of a lookup table.

1 9: (Original) The method of claim 8, wherein said lookup table includes values such that the
2 luminance of said one or more organic light emitting diodes (OLEDs) achieved by the
3 adjustment essentially decreases over time.

1 10: (Previously Presented) The method of claim 1, wherein said method further comprises
2 adjusting the luminance of said one or more organic light emitting diodes (OLEDs) based, at
3 least in part, upon estimating the amount of degradation of one or more other organic light
4 emitting diodes (OLEDs).

1 11: (Previously Presented) An apparatus comprising:
2 one or more organic light emitting diodes (OLEDs);
3 a measurement circuit capable of estimating the amount of degradation of the OLEDs;

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

4 and
5 a control system having a desired luminance, as a function of time, for the OLEDs;
6 wherein the control system is capable of, utilizing at least in part the estimated amount of
7 degradation, attempting to adjust (adjusting) the luminance of the OLEDs to the desired
8 luminance.

12: (Cancelled).

1 13: (Previously Presented) The apparatus of claim 11, wherein the estimation of the amount of
2 degradation, made by said measurement circuit, includes an estimation of a characteristic
3 substantially correlated with said degradation.

1 14: (Original) The apparatus of claim 13, wherein said measurement circuit is capable of
2 measuring the reverse bias resistance of said one or more organic light emitting diodes (OLEDs)
3 operating at a substantially constant current.

1 15: (Previously Presented) The apparatus of claim 11, wherein said control system is capable of
2 adjusting said luminance of said one or more organic light emitting diodes (OLEDs) by adjusting
3 the substantially instantaneous current through said OLEDs.

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

1 16: (Previously Presented) The apparatus of claim 11, wherein said control system comprises a
2 series of data that correlates a desired luminance with the estimated degradation of said one or
3 more OLEDs.

1 17: (Original) The apparatus of claim 16, wherein said control system utilizes said series of data
2 to adjust the luminance of said one or more OLEDs.

1 18: (Original) The apparatus of claim 17, wherein said control system comprises a series of data
2 that correlates a desired luminance with the estimated degradation of said one or more OLEDs
3 such that said desired luminance decreases as said estimated degradation of said one or more
4 OLEDs increases.

1 19: (Previously Presented) The apparatus of claim 11, wherein said control system includes a
2 storage medium having a plurality of machine accessible instructions, wherein, when said
3 instructions are executed by said control system, the instructions provide for
4 utilizing a signal from said measuring circuit;
5 estimating a desired luminance for said OLEDs; and
6 adjusting the current applied to said OLEDs based at least in part upon said signal.

Claims 20 – 29: (Cancelled).

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

APPENDIX B: EVIDENCE APPENDIX

To the best of Appellants' knowledge, there is no evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 or of any other evidence entered by the examiner and relied upon by appellant in the present appeal that will directly affect, be directly affected by, or have a bearing on the Board's decision.

Appl. No. 09/976,199

Attorney Docket: 042390.P9821

APPENDIX C: RELATED PROCEEDINGS APPENDIX

To the best of Appellants' knowledge, there are no appeals or interferences related to the present appeal that will directly affect, be directly affected by, or have a bearing on the Board's decision.